

AMENDMENT
Application No.: 09/676,422

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August 23, 2004

REMARKS

Claims 1-28 remain in the application and stand rejected.

The Examiner correctly identified a typographical error in the prior amendment which inadvertently indicated that a replacement paragraph was intended to replace a paragraph at page 14 line 1. The Examiner correctly noted that the replacement paragraph was for the paragraph at page 13, line 1. Please amend the application accordingly.

Claims 1 – 7, 9 – 17, 21 – 25, 27 and 28 are rejected over Hunt et al. (U.S. Patent No. 6,629,123) in view of Ibe et al. (U.S. Patent No. 6,437,804) under 35 U.S.C. §103(a). Claims 8, 18 – 20 and 26 are rejected over Hunt et al. and Ibe et al. ad further in view of previously cited Padberg et al. The rejection is respectfully traversed.

The Examiner asserts that Hunt et al. teaches the invention substantially as claimed, e.g., three of the four steps recited claim 1. Thus, the Examiner finds Hunt et al. to teach steps (a) and (d) at col. 23, lines 13-23 and step (c) at col. 24, lines 8-28. The Examiner found that Hunt et al. does not teach step (b), for which the Examiner turns to Ibe et al.

Further, the Examiner asserts that "Ibe teaches the invention as claimed, including the following limitations not shown by Hunt: b) identifying independent nets in said communication graphs (col. 8 line 31 – col. 9 line 32)." The Examiner did not, however, reject the present invention over Ibe et al. alone under 35 U.S.C. §102 or §103(a). Instead, the Examiner reasons that

Ibe provides multiple partitioning algorithms that seek to produce independent graphs that reduce bottlenecks. Ibe introduces the concept of anchor nodes that serve as a base node for a cluster, which allow for partitioning the network in a manner that eliminates weak links of communication, thereby improving the communication across clusters

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(independent nets). Although it is noted that Ibe is mostly described within a network communication topology, the application is not limited to this. Applicants note, however, that Ibe et al. clusters are not the same as independent nets as described in the present application. While the Examiner asserts that, it "would have been obvious to one of ordinary skill in the art to combine Hunt with Ibe ..." Since Ibe et al. teaches the invention, to what purpose? Be that as it may, the Examiner concludes that, "the combination of partitioning performed by Hunt and Ibe would allow task components to be optimally distributed across various system components, while eliminating communication (or inter-process communication) bottlenecks, such that overall system performance is greatly improved."

As has been previously noted, Hunt et al. teaches an "automatic distributed partitioning system (ADPS) intercepts function calls to unit activation functions that dynamically create application units, such as a component instantiation function." See, Hunt et al. Abstract. A "distribution optimization algorithm accepts a model of the decision problem and ... decides where application units will be placed in the network." *Id.*, col. 23, lines 13 – 17. "[T]he application units and inter-unit communication form a commodity flow network. After this mapping, known graph-cutting algorithms can be used for automatic distributed partitioning." *Id.*, lines 20 – 23. Finally, Hunt et al. teaches that "the minimum cut contains edges with the smallest weights (capacities), those edges represent the line of minimum communication between the client and server." *Id.*, col. 24, lines 25 – 28.

Ibe et al. teaches modeling a network as a graph, partitioning the graph, "assigning a weight to each node in the graph, and... balancing partitions as a function of the weight of each node in a respective partition." See, col. 2, lines 37 – 43. Ibe et al. types edges or links as normal, strong and weak (which are not included in any partition). See, col. 5, lines 47 – 51. A "node on which a control agent is attached is defined as an 'anchor node.'" Col. 6, lines 24 – 25. The graph may be partitioned such that each partition includes only one anchor node. Col. 2, lines 56 – 60 and col. 3, lines 39 – 45. In particular, "supernodes are formed from nodes in the graph and clusters are formed

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from the supernodes around each of the anchor nodes, such that each cluster includes only one anchor node. The weights of the clusters are balanced and domains are generated from the clusters." *Id (emphasis added)*. In particular, Ibe et al teaches assigning each of the nodes of the graph to a cluster wherein the number of Ibe et al. anchor nodes may or may not be sufficient to assign one cluster for each anchor node. See, Figure 3A – B of Ibe et al. and step 16 in particular. Thus, Ibe et al. teaches identifying triangular supernodes in the graph, wherein a "supernode" is a set of nodes that are mutually adjacent to one another and there is no weak edge between any two members of the set (i.e. a fully connected graph with no weak edges). The simplest supernode is a triangular supernode or triplet." Col. 8, lines 8 – 12, *see, e.g.*, Ibe et al. Fig. 2. Next, any uncovered nodes that are not included in any triangular supernodes are identified, wherein a "node is considered 'covered' if it is included in at least one supernode or one cluster; a node is 'uncovered' if it is not included in a supernode or cluster." *Id*, lines 20 – 22. "Cluster" simply refers to a set of nodes. In one embodiment, clusters are simply different sets of nodes that are formed and then adjusted until an acceptable partitioning of the graph is identified." *Id*, lines 16 – 19. So, if the number of uncovered nodes is less than half the total number of nodes, a cluster is "formed by starting with a first supernode that includes an anchor node (step 17)." *Id*, lines 54 – 55. Clusters increase in size by merging with supernodes until they cannot be increased further, i.e., no "supernode that includes another anchor node can be included in the cluster." *Id*, lines 62 – 64. Once all of the nodes are clustered, the clusters are balanced for an approximately equal node weighting amongst the clusters. Col. 9, lines 16 – 22.

The specification of the present application clearly recites at page 10, lines 18 – 20, that "an independent net is a subset of components that do not communicate with any other subset of components." *See, e.g.*, Figure 4. In particular, the "communication graph is partitioned into subgraphs that are independent nets by repeatedly picking a "seed node" from nodes remaining in the communication graph and branching out until terminal nodes have been reached along all paths." *Id*, lines 16 – 20 (*emphasis added*) and *see, e.g.*, claim 4.. The "(t)erminal nodes representative of the multiple computers are attached to the communication graph." Page 5, lines 13 – 14. "Participating

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individuals (individuals receiving and executing distributed tasks) are referred to as terminal nodes or machine nodes." Page 6, lines 22 – 23. So, while the terminal nodes may include a control agent, a control agent and/or anchor node are not necessarily a terminal node and vice versa.

For example, applying the steps of rejected claim 4 to Figure 5C of Ibe et al. and assuming *arguendo* that the anchor nodes 3, 6 and 10 are terminal nodes for this example: first a node (e.g., 8) is selected as a seed node; then, adjacent nodes 5, 9, 11 and 12 are identified as the outer perimeter; next, nodes 3, 4, 6, 7, 10 and 14, which are adjacent to outer perimeter nodes 5, 9, 11 and 12 are identified to expand the perimeter; finally, repeating, nodes 1, 2 and 13 which are adjacent to outer perimeter nodes 3, 4, 6, 7, 10 and 14 are identified to expand the perimeter and "terminal nodes have been reached along all paths." *Supra*. Clearly, the clusters of Ibe et al. are not necessarily independent nets and clustering as described in Ibe et al. results in something quite different than identifying independent nets. The result does not change with the seed node selection and Figure 5C of Ibe et al. does not contain more than 1 independent net. Accordingly, Ibe et al. does not teach "the invention as claimed, including the following limitations not shown by Hunt: b) identifying independent nets in said communication graphs [at] (col. 8 line 31 – col. 9 line 32)." Neither does the combination of Ibe et al. with Hunt et al. result in the present invention.

As has been previously noted, obviousness is based on a legal standard, not what one may feel with respect to the particular invention. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). An obviousness rejection cannot be based the combination of bits and pieces of various references in the light of Applicants' teachings. An extensive discussion of the criteria to be applied in obviousness rulings is set forth in *Aqua-Aerobic Systems Inc. v. Richards of Rockford*

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Inc., 1 U.S.P.Q. 2d 1945, 1955-57 (N.D. Ill. 1986). "The fact that a prior art reference can be modified to show the patented invention does not make the modification obvious unless the prior art reference suggests the desirability of the modification. An attempted modification of a prior art reference that is unwarranted by the disclosure of that reference is improper." *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (emphasis added). See also, *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.).

In *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 15 ___, 37 USPQ2d 1626, 16 ___ (Fed. Cir. 1996), hereinafter *Pro-Mold*, the Federal Circuit provided that in determining obviousness, the starting point is "the self-evident proposition that mankind, in particular, inventors, strive to improve that which already exists." *Pro-Mold* is especially helpful in understanding how the motivation can arise from the problem under 35 U.S.C. §103(a), which is the thrust of the Examiner finding the present invention *prima facie* obvious, i.e. that "the combination of partitioning performed by Hunt and Ibe would allow task components to be optimally distributed across various system components, while eliminating communication (or inter-process communication) bottlenecks, such that overall system performance is greatly improved." In finding the motivation to combine to arise from the problem in *Pro-Mold*, the Federal Circuit found that the two cited references fit as hand in glove, i.e.,

the reason to combine arose from the very nature of the subject matter involved, the size of the card intended to be enclosed. There was surely a reason to combine a reference describing an elegant card holder and cover arrangement with a reference describing a card holder no larger than necessary to enclose the card. The suggestion or motivation to combine these features of the prior art was thus evident from the very size of the card itself. Card holders larger than the card had already been designed, as evidenced at least by the Squeeze Tite card holder. On the other hand, a card holder no larger than necessary clearly was desirable in order to enable the card holders to fit in a set box. It would also avoid having the cards bang around in a holder larger than needed. Accordingly, the size of the card provided the motivation to combine the features of the prior art card holders and hence modify the size of the Squeeze Tite card holder so

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that it was not larger or smaller than the card, but rather substantially the size of the card. *Id.*

So, for example and to summarize, given a glove and a human body, the only use for the glove that would make sense is on a hand. This argument hardly fits the allegedly obvious combination of the previously described Hunt et al. ADPS that uses a “minimum cut [that] contains edges with the smallest weights” representing “the line of minimum communication between the client and server” (*Supra*) with Ibe et al.; wherein “clusters are formed from the supernodes around each of the anchor nodes, such that each cluster includes only one anchor node.” *Supra*. Accordingly, it is apparent that the present application is being used in hindsight to teach the combination, as well as for the motivation and suggestion to combine. As set forth hereinabove, such a use of the application is improper.

Therefore, because Ibe et al. anchor nodes are quite different from terminal nodes in both form and function; because clustering nodes does not identify independent nets; because Hunt et al. in combination with Ibe et al. does not result in the present invention as recited in any of claims 1 – 7, 9 – 17, 21 – 25, 27 and 28; because the references fail to suggest combining or to provide a motivation to combine; and because such a combination requires resorting to improper hindsight for a teaching, motivation and/or suggestion to combine; the present invention as claimed in claims 1 – 7, 9 – 17, 21 – 25, 27 and 28 is not made obvious by Hunt et al. and Ibe et al., either alone or in combination with each other or with any other reference of record. Therefore, reconsideration and withdrawal of the rejection of claims 1 – 7, 9 – 17, 21 – 25, 27 and 28 over Hunt et al. in view of Ibe et al. under 35 U.S.C. §103(a) is respectfully solicited.

Regarding the rejection of claims 8, 18 – 20, and 26 over Hunt et al. and Ibe et al. further in view of Padberg et al. under 35 U.S.C. §103(a), Padberg et al. fails to add anything to either of Hunt et al. or Ibe et al. to result in the present invention as recited in any of independent claims 1, 12, 21, much less claims 8, 18 – 20, and 26, which depend therefrom. Accordingly, the combination of Padberg et al. with Hunt et al. and Ibe et al. still does not result in the invention as claimed in claims 8, 18 – 20, and 26.

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Reconsideration and withdrawal of the rejection of claims 8, 18 – 20, and 26 over Hunt et al. and Ibe et al. with Padberg et al. under 35 U.S.C. §103(a) is respectfully solicited.

The applicants thank the Examiner for efforts, both past and present, in examining the application. Believing the application to be in condition for allowance, both for the amendment to the claims and for the reasons set forth above, the applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1 – 28 under 35 U.S.C. §103(a) and allow the application to issue.

Should the Examiner believe anything further may be required, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below for a telephonic or personal interview to discuss any other changes. Please charge any deficiencies in fees and credit any overpayment of fees to IBM Corporation Deposit Account No. 50-0510 and advise us accordingly.

Respectfully Submitted,



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(Date)

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